EX_{pression of} I_{nformation based on} S_{et} T_{heory}
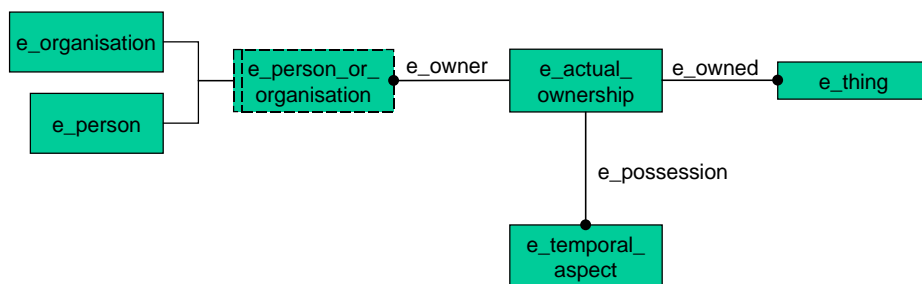
for Entity Relationship models

Matthew West - Shell Services International

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Ownership - EXPRESS-G and EPISTLE

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1

Lexical Form

```
SCHEMA EPISTLE_ownership;
TYPE e_person_or_organisation =  SELECT
     (e_organisation,
      e_person);
END_TYPE;
ENTITY e_organisation;
END_ENTITY;
ENTITY e_ownership;
    e_owner : e_person_or_organisation;
    e_owned : e_thing;
END_ENTITY;
ENTITY e_person;
END_ENTITY;
ENTITY e_thing;
END_ENTITY;
END_SCHEMA;
```
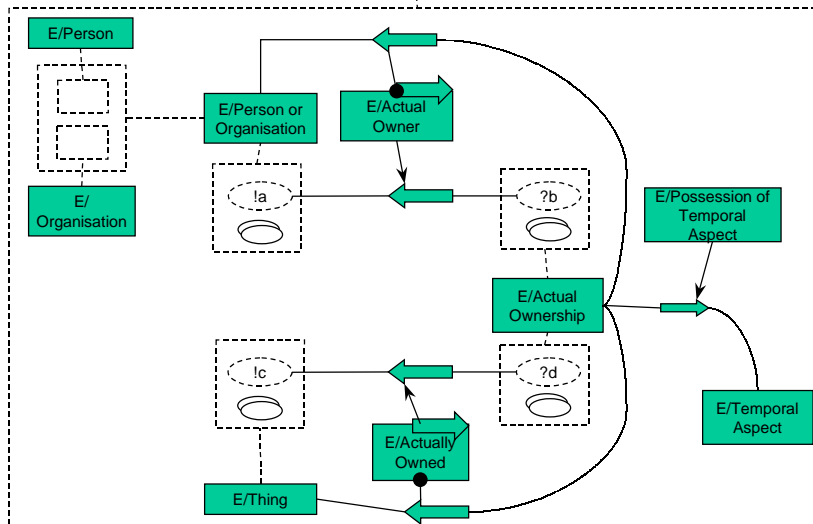
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EPISTLE Ownership

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2

Lexical Form
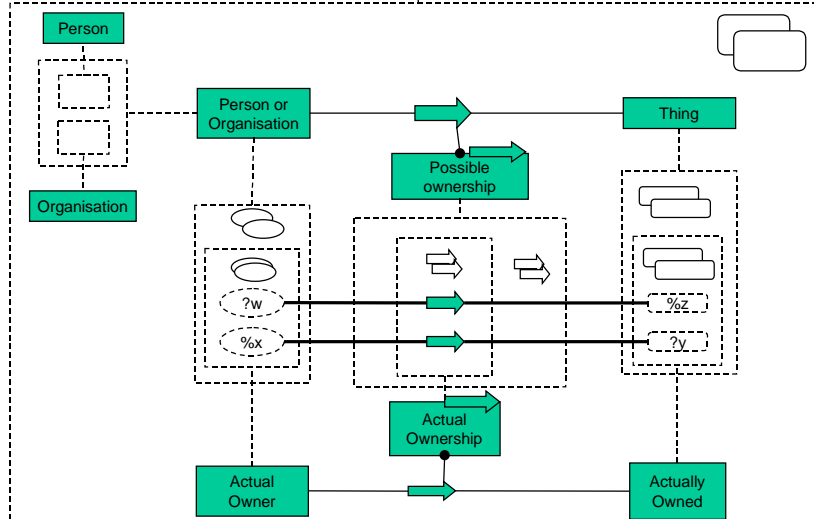
[$/Model: @E/Ownership]

[@E/Ownership -- {

[@E/Person or Organisation = @E/Person :U: @E/Organisation],

[@E/Actual Owner := < @E/Actual Ownership, @E/Person or Organisation>],

[@E/Actually Owned := < @E/Actual Ownership, @E/Thing>],

[@E/Person or Organisation: !a], [@E/Actual Ownership: ?b],

[@E/Actual Owner: < ?b, !a>],

[@E/Thing: !c], [@E/Actual Ownership: ?d],

[@E/Actually Owned: < ?d, !c>]

}]

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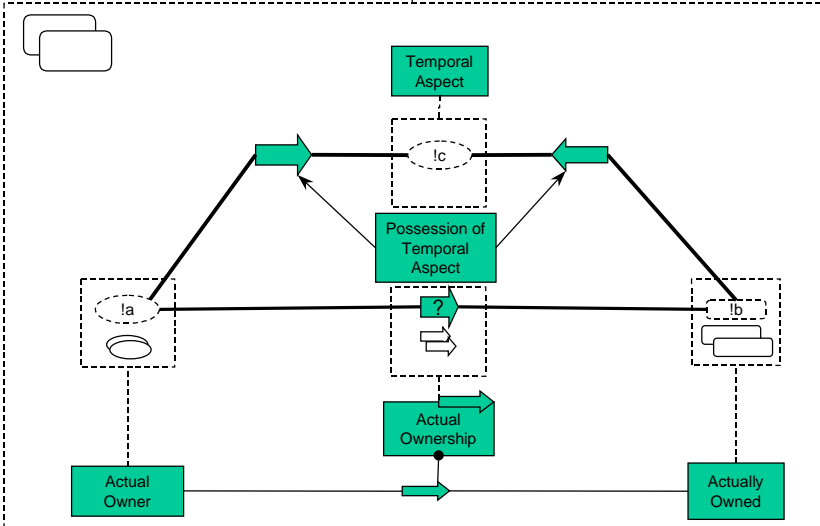---

IM Ownership

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3

IM Ownership

Temporal
Aspect

!c

Possession of
Temporal
Aspect

!a

?

!b

Actual
Ownership

Actual
Owner

Actually
Owned

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Lexical Form

[$/Model: @IM/Ownership]

[@IM/Ownership -- {

[@IM/Person or Organisation = @IM/Person :U: @IM/Organisation],

[@IM/Owner -< @IM/Person or Organisation],

[@IM/Owned -< @IM/Thing],

[@IM/Actual Ownership = < @IM/Possible Ownership],

[@IM/Possible Ownership := < @IM/Person or Organisation, @IM/Thing>],

[@IM/Actual Ownership := < @IM/Actual Owner, @IM/Actually Owned>],

[@IM/Actual Owner:%x], [@IM/Actually Owned: ?y],

[@IM/Actual Ownership: < %x, ?y>],

[@IM/Actual Owner:?w], [@IM/Actually Owned: %z],

[@IM/Actual Ownership: < ?w, %z>],

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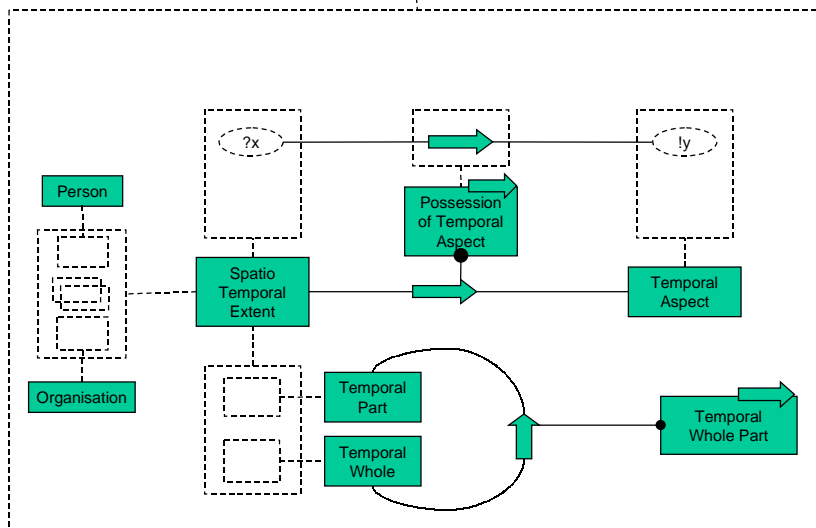slide 8

Lexical Form

[@IM/Actual Owner: !a],
[@IM/Actually Owned: !b],
[@IM/Temporal Aspect: !c],
[@IM/Actual Ownership: ?< !a, !b>],
[@IM/Possession of Temporal Aspect: < !a, !c> &
    @IM/Possession of Temporal Aspect: < !b, !c>]
}]

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IM Temporal Whole Part

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Lexical Form

[$/Model: @IM/Temporal Whole Part]

[@IM/Temporal Whole Part -- {

[@IM/Person -< @IM/Spatio Temporal Extent],

[@IM/Organisation -< @IM/Spatio Temporal Extent],

[@IM/Temporal Part -< @IM/Spatio Temporal Extent],

[@IM/Temporal Whole -< @IM/Spatio Temporal Extent],

[@IM/Temporal Whole Part := < @IM/Temporal Whole, @IM/Temporal Part>],

[@IM/Possession of Temporal Aspect := < @IM/Spatio Temporal Extent,
@IM/Temporal Aspect>],

[@IM/Spatio Temporal Extent: ?x],

[@IM/Temporal Aspect: !y],

[@IM/Possession of Temporal Aspect: < ?x, !y>]

}]

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Mapping from EPISTLE to IM

[$/Model: @IM/Mapping of EPISTLE to IM Ownership]

[@IM/Mapping of EPISTLE to IM Ownership -- {

[@E/Person = @IM/Person :I: @IM/Temporal Whole],

[@E/Organisation = = @IM/Organisation :I: @IM/Temporal Whole],

[@E/Person or Organisation = = @IM/Person or Organisation :I: @IM/Temporal
Whole],

[@E/Thing = = @IM/Thing],

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6

Mapping from EPISTLE to IM

[{ [@E/Actual Ownership: ?x],
   [@E/Thing: !z], @E/Actual Owner: !< !x, !y>],
   [@E/Temporal Aspect: !w], [@E/Person or Organisation: !y], [@E/Actually
   Owned: !< !x, !z>]}

= { @IM/Thing: !z],
   [(@IM/Person or Organisation :I: @IM/Temporal Whole): !y],
   [@IM/Actual Owner: ^a], [@IM/Actually Owned: ^b],
   [@IM/Temporal Aspect: !w],
   [@IM/Actual Ownership: ?< !a, !b>],
   [@IM/Possession of Temporal Aspect: < !a, !w>],
   [@IM/Possession of Temporal Aspect: < !b, !w>],
   [@IM/Temporal Whole Part: {< !y, !a> , < !z, !b> , …}]}]

}]

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